ELEVATOR APPARATUS

PANEL SELECTOR

PIECE-PART DATA AND REPLACEMENT PROCEDURES

1. GENERAL

1.01 This section covers the information necessary for ordering parts to be used in the maintenance of panel district, office, incoming, and final selector elevator apparatus. It also covers approved procedures for replacing these parts.

1.02 This section is reissued to omit the procedures covering the repair of brush rods since the information is covered in Section 026-125-821 and to amplify the procedures for multiple brush replacements. Detailed reasons for reissue will be found at the end of the section.

1.03 Part 2 of this section covers the piece-part numbers and the corresponding names of the parts which it is practicable to replace in the field in the maintenance of the above apparatus. No attempt should be made to replace parts not designated. Part 2 also contains explanatory figures showing the different parts. This information is called Piece-part Data.

1.04 Part 3 of this section covers the approved procedures for the replacement of the parts covered in Part 2. This information is called Replacement Procedures.

1.05 In general, before making replacements of any part of the apparatus covered herein, make the associated circuit and the circuits associated with the brush rods which are adjacent to it, busy in the approved manner.

1.06 A brush rod which is worn excessively at the bottom where it rests on the rack shoulder or which is cracked or broken at the rack tongue slot should be repaired in accordance with Section 026-125-821.

2. PIECE-PART DATA

2.01 The figures included in this part show the various piece parts in their proper relation to other parts of the elevator apparatus. The piece-part numbers of the various parts are given together with the names of the parts as listed by the Western Electric Company Merchandise Department. When these names differ from those in general use in the field, the latter names, in some cases, are shown in parentheses.

2.02 When ordering piece parts for replacement purposes, give both the number and name of the piece part. For example, P-173971 Screw. Do not refer to the BSP number or to any information shown in parentheses following the piece-part numbers.

2.03 Information enclosed in parentheses ( ) is not ordering information. It may be references to notes, parts referred to in other portions of the section and not considered replaceable, and where the name in general use in the field differs from the part name assigned by the manufacturer.

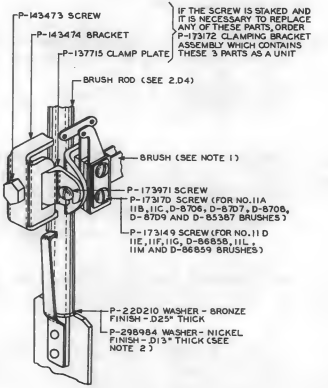
2.04 ***Brush Rods:*** Brush rods are coded both with and without multiple and commutator brushes. When a completely assembled rod (including multiple and commutator brushes and trip rod) is required, order the rod by the code number as shown in the second column of Table A. When an individual item is required, order the item as shown in the table under the proper heading.

© American Telephone and Telegraph Company, 1959
Printed in U. S. A

TABLE A

USAGE	CODE NO. OF ROD ASSEMBLED*	CODE NO. OF TRIP ROD ONLY	CODE NO. OF BRUSH ROD ONLY**	CODE NO. OF BRUSH (MULTIPLE)	CODE NO. OF BRUSH (COMMUTATOR)	CODE NO. OF GUIDE
Incoming	1009P	1A	9A	11L Replaced 11N	14B	1B
District and Office	1009R	1A	9A	11L	14B	1B
Ground Cut-off Final	1009S	1A	9A	11M	14C	1B
Battery Cut-off Final	1009T	1A	9A	11M	14B	1B

*Does not include pointer.
**Includes stop collars but not pointer or 1-type guide.


P-143473 SCREW
P-143474 BRACKET
P-137715 CLAMP PLATE
IF THE SCREW IS STAKED AND IT IS NECESSARY TO REPLACE ANY OF THESE PARTS, ORDER P-173172 CLAMPING BRACKET ASSEMBLY WHICH CONTAINS THESE 3 PARTS AS A UNIT
BRUSH ROD (SEE 2.04)
BRUSH (SEE NOTE 1)
P-173971 SCREW
P-173170 SCREW (FOR NO. 11A 11B, 11C, D-8706, D-8707, D-8708, D-8709 AND D-85387 BRUSHES)
P-173149 SCREW (FOR NO. 11D 11E, 11F, 11G, D-86858, 11L, 11M AND D-86859 BRUSHES)
P-22D210 WASHER - BRONZE FINISH - .025" THICK
P-298984 WASHER - NICKEL FINISH - .013" THICK (SEE NOTE 2)

Note 1: Specify code number of brush desired. Brushes are furnished less the P-173971 screws and P-173172 clamping bracket assembly if specified in order.

Note 2: Washer used only in obtaining proper clearance between rack tongue and notch in brush rod, particularly when earlier-type rack without washer is replaced by later-type rack with washer.

Fig. 1 – Multiple Brush Parts and Rack Bearing Washer

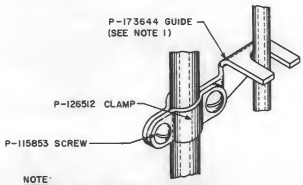


Fig. 2 – 1-type Guides

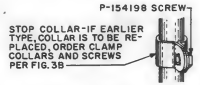


Fig. 3A – Earlier-type Brush Rod Upstop and Downstop Collar

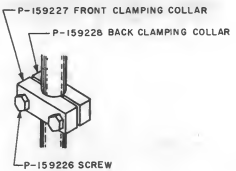


Fig. 3B – Later-type Brush Rod Upstop and Downstop Collar

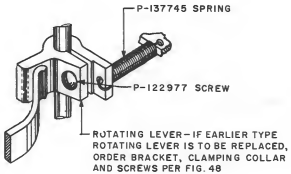
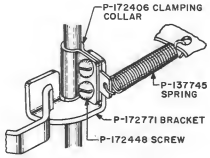

P-137745 SPRING
P-122977 SCREW
ROTATING LEVER – IF EARLIER TYPE ROTATING LEVER IS TO BE REPLACED, ORDER BRACKET, CLAMPING COLLAR AND SCREWS PER FIG. 48

Fig. 4A – Earlier-type Rotating Lever



NOTE: CLAMPING PLATE (NOT ILLUSTRATED) FORMERLY USED UNDER SCREWHEADS BUT MAY BE OMITTED.

Fig. 4B – Later-type Rotating Lever Assembly

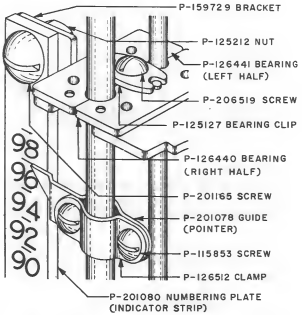


Fig. 5 – No. 8A Indicator and 3-type Bearing

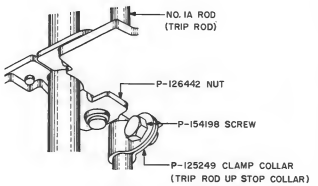


Fig. 6 – 3-type Bearing and Trip Rod Upstop Collar

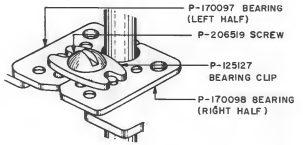


Fig. 7 – 4-type Bearing

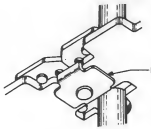


Fig. 8 – 4-type Bearing

3. REPLACEMENT PROCEDURES

3.01 ***List of Tools and Materials***

CODE OR SPEC NO.	DESCRIPTION
TOOLS	
206	30-degree Offset Screwdriver
207	90-degree Offset Screwdriver
240	Scriber
245	3/8-inch and 7/16-inch Hex. Open Double-end Flat Wrench
372	5/16-inch Hex. Open Single-end Offset Wrench
400A	Commutator Brush Spacer
555A	3/16-inch Hex. Single-end Socket Wrench
KS-2631	Screwdriver
TP-75503M	Push Spring Hook
—	P-Long-nose Pliers
—	3-inch Cabinet Screwdriver
—	6-inch Cabinet Screwdriver
—	4-inch Regular Screwdriver
MATERIALS	
KS-2423	Cloth
KS-7860	Petroleum Spirits
KS-14666	Cleaning Cloth
—	Canvas (Sufficient to cover all clutches on one side of a frame)
—	Spring Clothespin

3.02 Before replacing any part covered herein, check whether the replacing part is covered with a protective film of grease. If it is, remove the grease with KS-7860 petroleum spirits and then lubricate the part, if required, as outlined in Section 026-125-704.

3.03 After making any replacement of parts of panel selector elevator apparatus, the part or parts replaced shall meet the readjust requirements involved, as specified in Sections 026-125-704 and 026-120-701. Other parts whose adjustments may have been disturbed by the replacing operations shall be checked to the readjust requirements and an over-all operation check shall be made of the apparatus before restoring the circuit to service.

3.04 No replacement procedures are specified for screws and other parts where the procedure consists of a simple operation.

BRUSH PARTS

3.05 Raise the associated brush rod so that the multiple brush is about halfway up the bank.

Clamping Plate

3.06 Loosen the two clamping plate mounting screws with the 3-inch cabinet screwdriver after having loosened the brush clamping bracket screw with the No. 555A socket wrench. Raise and remove the clamping bracket assembly. A visual inspection will now show whether or not the brush clamping bracket screw is staked. If it is, replace the clamping bracket assembly. If not, remove the brush clamping bracket screw and the clamping bracket and remount them on the new clamping plate. Turn the brush clamping bracket screw out sufficiently to permit remounting the assembly on the brush frame. Remount the clamping plate on the brush frame, and tighten the brush clamping bracket screw.

UPSTOP AND DOWNSTOP COLLARS AND 1-TYPE GUIDES

Upstop and Downstop Collars

3.07 If the collar acts as a downstop, raise the brush rod partway.

3.08 If the stop collar is of the ***later type*** (Fig. 3B), scribe a mark on the brush rod with the No. 240 scriber at a point where the bottom edge of the stop collar comes in contact with it and remove the two stop collar screws with the No. 555A wrench. Replace the old collar with a new one, setting it in the proper location by the scribe mark.

3.09 If the stop collar is of the ***earlier type*** (Fig. 3A), scribe a mark on the brush rod with the No. 240 scriber at the point where the bottom edge of the stop collar comes in contact with it. Remove the roundhead or hexagon head stop collar screw with the KS-2631 screwdriver or the No. 555A wrench. Spread the two flanges of the collar with the screwdriver blade until a pair of long-nose pliers can be inserted between them. Spread the flanges further apart with the pliers until the collar can be removed freely from the rod. Replace the collar by one of the later type, as covered in 3.08.

T-type Guide

3.10 To remove the guide or clamp, remove the guide screws with the No. 206 and 207 offset screwdrivers. The removal of these screws frees any parts which may require replacement.

TRIP ROD UPSTOP COLLAR AND ROTATING LEVER

Upstop Collar

3.11 Scribe a mark on the trip rod with the No. 240 scriber at the point where the bottom edge of the upstop collar comes in contact with it. Remove the buttonhead or the hexagon head screw with the KS-2631 screwdriver or the No. 555A wrench. Spread the two flanges of the upstop collar with the screwdriver blade until a pair of long-nose pliers can be inserted between them. Spread the flanges further apart with the pliers until the collar can be removed freely from the rod. In placing the new collar, spread it with the pliers until it will fit freely over the rod. Then squeeze the flanges together with the long-nose pliers and tighten the collar on the rod by means of the screwdriver or wrench. Place the collar in the position from which the old collar was removed and securely tighten the collar clamping screw.

Rotating Lever Retractile Spring

3.12 Raise the brush rod sufficiently to obtain access to the retractile spring. Unhook the old spring at the far end with the TP-75503M push spring hook and disconnect the spring from the rotating lever with the long-nose pliers. Hook one end of the new spring into the rotating lever and attach the other end of the spring to the reset plate by means of the spring hook.

Rotating Lever

3.13 Loosen the upstop collar, as covered in 3.11, so as to allow the trip rod to be raised. Remove the rotating lever retractile spring, as covered in 3.12.

3.14 If the rotating lever is of the ***later design*** (Fig. 4B), loosen the two rotating lever clamping screws with the 3-inch cabinet screwdriver, raise the trip rod, and remove the rotating lever assembly from the bottom of the rod. If it is desired to replace the bracket or clamping collar contained in the rotating lever assembly, remove the two rotating lever clamping screws with the 3-inch cabinet screwdriver. This frees any part of the assembly which may require replacement.

3.15 If the rotating lever is of the ***earlier design*** (Fig. 4A), loosen the rotating lever clamping screw with the 3-inch cabinet screwdriver, raise the trip rod, and remove the rotating lever from the bottom of the rod. Install a rotating lever of the later type, as covered in 3.14.

3.16 Reassemble the rotating lever on the trip rod. Connect the rotating lever retractile spring, as covered in 3.12, and set the rotating lever and trip rod in their correct positions.

INDICATOR PARTS

Pointer

3.17 Remove the pointer mounting screws with the No. 206 and 207 offset screwdrivers. The removal of these screws frees any parts which may require replacement.

Indicator Strip

3.18 Remove the indicator strip mounting screws with the 4-inch regular screwdriver, using the No. 372 wrench to hold the nut. Substitute the new indicator strip and reassemble the parts.

Bracket

3.19 Remove the indicator strip mounting screw, as covered in 3.18. Remove the indicator bracket mounting screw with the No. 245 wrench. Substitute the new bracket and reassemble the parts.

MULTIPLE BRUSH REPLACEMEMNTS

General

3.20 Cover the clutches on the side of the frame being worked on with a piece of canvas to protect against falling solder or screws.

3.21 Raise the brush rod until the multiple brush to be removed is approximately in the middle of the bank. Scribe a mark on the brush rod with the No. 240 scriber as an aid in properly locating the new brush. Unsolder the wires at the brush terminals and remove the brush, as outlined below.

3.22 When a multiple brush is mounted on a brush rod reinforcing sleeve and the sleeve is not soldered to the rod, make sure when mounting the new brush to position the sleeve so that the top of the slot lines up with the top of the slot in the brush rod.

3.23 After the brush has been replaced in accordance with the following procedures, solder the wires to the brush terminals. The proper colors can be ascertained by referring to a similar brush on an adjacent rod. If the rollers of the new brush bind, due to the presence of excess wax in their bearings, manually rotate the rollers so as to free them.

No. 0 Brush

3.24 To remove the brush, loosen the brush clamping bracket screw with the No. 555A socket wrench.

3.25 Uncouple the brush rod from the rack by inserting the blade of the 3-inch cabinet screwdriver between the rack tongue and brush rod, as shown in Fig. 9, and turn the screwdriver just enough to disengage the tongue from the brush rod slot.

Caution: Insert the blade of the screwdriver just below the horizontal portion or lip of the rack tongue so as to affect the tension of the rack tongue as little as possible.

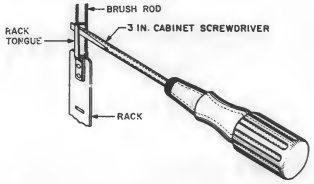


Fig. 9—Method of Uncoupling Rack From Brush Rod

3.26 Lift the brush rod away from the rack with the other hand. The rod now has no means of support so it will be necessary to hold it in place by clamping it with a spring clothespin just above a bearing plate as shown in Fig. 10, then slide the brush off the lower end of the rod. Carefully pull back the right-hand springs just far enough to permit the trip rod to pass between the roller and the sleeve spring and remove the brush.

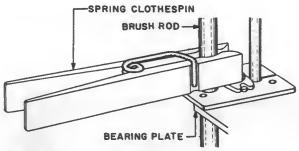


Fig. 10—Method of Placing Spring Clothespin

3.27 To mount the new brush, loosen the brush clamping bracket screw with the No. 555A wrench. The brush may now be slipped up over the bottom end of the rod. Carefully pull back the right-hand springs just far enough to permit the trip rod to pass between the roller and sleeve spring. Locate the brush springs so that they are in their proper positions with respect to their associated bank terminals and slide the brush up on the brush rod to approximately its proper location as indicated by the mark previously scribed on the rod. Tighten the clamping bracket screw sufficiently to hold it in place. Couple the rod and rack.

Intermediate Brushes

3.28 To remove the brush, raise the brush rod to its highest position, remove the bearing directly above the brush with the 6-inch cabinet screwdriver, loosen the brush clamping bracket screw with the No. 555A wrench and the clamping bracket assembly mounting screws with the 3-inch cabinet screwdriver, and remove the clamping bracket assembly.

3.29 Move the brush up on the rod until the springs are above the bank terminals, and swing it to the left until the brush frame is free of the brush rod. As it will be necessary to bow the brush rod outward slightly to clear the frame, exercise care not to distort or kink the rod. Pull the right-hand springs out to permit the trip rod to pass between the roller and sleeve spring as the clamp end of the brush is tipped downward, as shown in Fig. 11.

3.30 Trip the brush and, bringing the contact end of the springs forward, remove the brush from between the rods by moving the brush in a clockwise direction through an arc of 90 degrees and then drawing it out by moving the contact ends of the springs to the left.

3.31 Transfer the two clamping bracket assembly mounting screws from the old brush to the new brush. Trip the new brush, and holding it by the contact end with the flat side of the tip spring up, pass the brush between the rods to the left of the one on which it is to be mounted. These operations are the reverse of those given in 3.30.

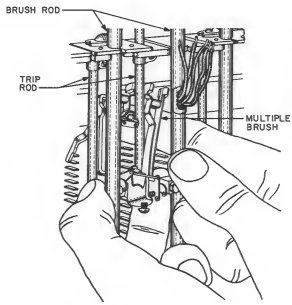


Fig. 11 – Method of Removing Multiple Brush

3.32 After the entire brush has passed between the rods, turn the contact end up and reset the brush. Pull back the springs to allow the trip rod to enter the brush. Keeping the brush above the bank terminals, pull the brush rod out slightly and turn the brush so that it will engage the rod. With the springs between the proper bank terminals, slide the brush down to approximately its correct position, as indicated by the mark previously scribed on the rod, and assemble the clamping bracket assembly on the brush. Tighten the clamping bracket assembly mounting screws and the multiple brush clamping screw. Reassemble the bearing.

No. 4 Brush

3.33 To remove the brush, raise the brush rod to its highest position and remove the clamping bracket assembly, as covered in 3.28. Then move the brush up on the rod until the springs clear the bank terminals and remove the brush from between the rods.

3.34 Transfer the two clamping bracket assembly mounting screws from the old brush to the new brush. Set the new brush in place by passing the brush springs down over the top terminals. Slide the brush down on the

rod to approximately its correct location, as indicated by the mark scribed on the rod. Mount the clamping bracket assembly on the brush. Tighten the brush clamping bracket screw.

RACK REPLACEMENT

3.35 If an examination of the No. 1A or 2A rack indicates that the rack shoulder has been worn, replace the rack as covered in Section 026-115-801.

Note: When one of these racks is replaced by a No. 1C or No. 2C rack, one washer in addition to the one with which the rack is equipped shall be added.

BRUSH ROD AND TRIP ROD REPLACEMENT

3.36 Raise the brush rod. Uncouple the brush rod from the rack and support the rod with a spring clothespin, as covered in 3.25 and 3.26.

3.37 Lower the rack to its normal position. Lower the brush rod until it is about 2 inches above its normal (down) position.

3.38 Unhook the rotating lever retractile spring, as covered in 3.12. Loosen the bearing clip mounting screws with the KS-2631 screwdriver and remove the bearing halves. Keep the halves together to facilitate replacement. Loosening of the bearings also frees the trip rod, so take the trip rod and brush rod out as a unit to be separated later.

3.39 Remove the frame cross member to provide sufficient room for removal of the brush rod and trip rod.

3.40 Unsolder the wire from the lower terminal of the associated commutator. Insert the No. 400A commutator brush spacer between the springs and commutator just above the brush frame and raise the spacer until it rests against the tips of the commutator brush springs.

3.41 Loosen the commutator latch plate clamping screws with the 3-inch cabinet screwdriver and remove the latch plate.

3.42 Remove the spring clothespin, hold the top of the rods, and move the top of the commutator forward to disengage the notch at the cross member at the top of the commutator. Raise the commutator until the bottom end is free from the frame. Pull the commutator upward so that it is freed from the brush rod and commutator brush.

3.43 Mount the commutator temporarily in position and carefully lower the brush and trip rods to a horizontal position. Remove the No. 400A commutator brush spacer.

Replacement of Brush Rod by Brush Rod Without Assembled Brushes (9-type Rods)

3.44 When the rod is to be replaced by a rod on which the multiple or commutator brushes are not mounted, remove the brushes or any other parts to be re-used from the old rod and mount them in approximately the same positions on the new rod. Proceed as outlined in 3.46 to 3.52, inclusive.

Replacement of Brush Rod and Assembled Brushes (1009-type Rods)

3.45 When the rod is to be replaced by a brush and trip rod assembly having the multiple and commutator brushes attached, proceed as outlined in 3.46 to 3.52, inclusive.

Remounting Brush Rods and Trip Rods

3.46 Insert the No. 400A commutator brush spacer between the springs of the commutator brush, as outlined in 3.40.

3.47 Raise the assembled rod with the trip rod as a unit carefully to a vertical position, move the commutator forward, as outlined in 3.42, and insert the commutator into the No. 400A commutator brush spacer. Remount the commutator and press the top of the commutator against the back of the slot in the cross member at the top of the commutator so that the locating slot in the rear of the commutator engages the plate properly.

3.48 Allow the rods to come into position in the slots of the bearing plates and support the brush rod with a spring clothespin, as covered in 3.26. Rehook the rotating lever retractile spring. Remove the clamps provided on the 1009-type brush rod assembly.

3.49 Remount the commutator latch plate and tighten the clamping screws securely. Resolder the wire to the lower commutator terminal.

3.50 Remove the No. 400A commutator brush spacer by sliding it down until it rests on the commutator brush frame and then withdraw it from the brush assembly. Remount the frame cross member.

3.51 Remount the bearings. Raise the rack, couple it to the brush rod, and remove the spring clothespin.

3.52 Position the commutator brush, as required, in order to meet the requirements covered in Section 026-120-701. Also check other apparatus, as covered in Section 026-125-704.

REASONS FOR REISSUE

1. To add a paragraph referring to Section 026-125-821 covering repair of brush rods (1.06).
2. To add a paragraph defining the information enclosed in parentheses (2.03).
3. To revise Fig. 1.
4. To omit No. 108A brush rod gauge and smooth cut flat file (3.01).
5. To amplify the procedure covering multiple brush replacements (3.22).
6. To amplify the procedure covering rack replacement (3.35).
7. To omit the procedure covering brush rod reinforcing sleeve (covered in Section 026-125-821).
8. To omit the procedure and figure covering reconditioning brush rods worn by rack (covered in Section 026-125-821).